

Remarks

The invention is directed at an illumination device that includes a light source and a light fiber. The light fiber includes an elongate polymeric core, a light-emitting region, and a continuous outer cladding layer. The light-emitting region includes at least one optical element comprising an indentation formed in the core by an embossing process. The optical element can provide directed sidelight along a length of the light fiber. The outer cladding layer extends over the lateral surface of the core and the at least one optical element. Accordingly, the illumination device can provide both end lighting and directed sidelighting thereby allowing the illumination device to be used for illuminating in hard-to-reach areas.

The outstanding office action includes three prior art-based rejections. Claims 1-5 and 8-17 stand rejected under 35 U.S.C. § 102(e) over U.S. Patent No. 6,301,418 (Freier et al.). Claims 6 and 7 stand rejected under 35 U.S.C. § 103(a) over Freier et al. and U.S. Patent No. 6,267,492 (Reid et al.). Claim 18 stands rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 5,845,038 (Lundin et al.). These rejections are traversed.

The Rejection under 35 U.S.C. § 102(e) over Freier et al.

Freier et al. are directed at providing an optical waveguide that generates diffuse light along its length. The diffuse light is generated as a result of roughening a length of the inner surface of the cladding. According to Freier et al., the "inner surface is roughened in a non-uniform manner to produce a predetermined light extraction pattern from the waveguide." See Freier et al. at column 1, line 58 through column 2, line 17. Freier et al. do not disclose an illumination device according to the presently claimed invention where a light-emitting region includes at least one optical element wherein the optical element comprises an indentation formed in the core by an embossing process.

In contrast to Freier et al., the invention is directed at an illumination device that provides directed light along at least a portion of the light-emitting region of the light fiber. The light-emitting region includes at least one optical element comprising an indentation formed in the core by an embossing process. In addition, the light fiber includes a continuous outer cladding layer that extends over the at least one optical element. The Examiner's attention is directed at an

exemplary embodiment of the invention described by the specification at page 7, line 14 through page 8, line 14, in the context of Figures 1 and 1a. As described and shown, the elongate central core 12 and outer cladding layer 14 include optical elements 16 that are in a form of a series of embossed indentations.

The outstanding office action contends that: "Freier et al. disclose a light source [116], a light fiber [100] including an elongate polymeric core [102], a light-emitting region [118], an optical element [108] and a continuous outer cladding layer [104] (figures 1, 3, 5B, 6 and 7, column 3 lines 50-57, column 4 lines 62-67, column 5 lines 25-34)." See page 3 of the outstanding office action. However, Freier et al. fail to disclose an optical element as a result of an indentation formed in the core by an embossing process as provided by the presently claimed invention. The "indentations 108" described by Freier et al. refer to the inner surface of the cladding 104 that is roughened. The Examiner's attention is directed at Freier et al. at column 4, lines 25-32 and 47-48, and column 4, line 62 through column 5, line 3. The "indentations 108" described by Freier et al. do not refer to optical elements as a result of indentation formed in the core by an embossing process according to the presently claimed invention. Furthermore, the definition of "optical element" provided by the specification at page 5, lines 11-18, excludes "scratches and other imperfections and other surface irregularities, which may occur from time to time in light fibers." Clearly, the scratches provided as a result of roughening the inner surface of the cladding 104 according to Freier et al. are not "optical elements" according to the invention.

In view of the above comments, it is clear that Freier et al. fail to disclose an illumination device according to the presently claimed invention wherein a light-emitting region is provided that includes at least one optical element comprising an indentation formed in the core by an embossing process. As a result, the claimed invention is not anticipated by Freier et al., and withdrawal of the rejection over Freier et al. is requested.

The Rejection under 35 U.S.C. § 103(a) over Freier et al. and Reid et al.

One having ordinary skill in the art would not have received the suggestion to modify Freier et al. to replace the roughened inner surface of the cladding that provides diffuse sidelighting with an optical element that includes an indentation formed in the core by an

embossing process to provide directed sidelighting. Freier et al. is directed at providing diffuse light as a result of roughening the inner surface of the cladding. See Freier et al. at column 1, line 57 through column 2, line 17. The optical element provided along the light-emitting region of the presently claimed illumination device provides for directed light. No reason has been provided in the outstanding office action for modifying Freier et al. in a manner that replaces the intended result by Freier et al. of diffuse sidelighting with directed sidelighting. It is submitted that such a modification would destroy the teachings of Freier et al.

Reid et al. disclose an illumination device that can provide directed or diffuse light as sidelight. See Reid et al. at column 1, lines 43-58. Exemplary techniques disclosed by Reid et al. for providing sidelighting include providing reflective optical elements 126, providing an extraction strip 226, and providing an optically rough surface 326. See Reid et al. at column 5, line 60 through column 6, line 57, and Figures 3A, 3B, and 3C. It is submitted that Reid et al. do not disclose or suggest creating sidelighting by the use of an optical element formed as an indentation in the core by an embossing process as provided by the presently claimed invention.

One having ordinary skill in the art would not have received the suggestion from Reid et al. to modify Freier et al. to achieve an illumination device having a light-emitting region that includes at least one optical element comprising an indentation formed in the core by an embossing process according to the present invention. Accordingly, withdrawal of the rejection over Freier et al. and Reid et al. is requested.

The Rejection under 35 U.S.C. § 103(a) over Freier et al. and Lundin et al.

One having ordinary skill in the art would not have received the suggestion from Lundin et al. to modify Freier et al. to achieve the presently claimed illumination device. As discussed above, Freier et al. is directed at providing diffuse light as a result of roughening the inner surface of the cladding. See Freier et al. at column 1, line 57 through column 2, line 17. The optical element provided along the light-emitting region of the presently claimed illumination device provides for directed lighting. No reason has been provided in the outstanding office action for modifying Freier et al. to replace the intended result of providing diffuse sidelighting with an optical element according to the invention that provides for directed sidelighting. Furthermore, it is submitted that such a modification would destroy the teachings of Freier et al.

Lundin et al. describe an illumination system that includes an optical fiber and a light emitting region that extends along a portion of the fiber, wherein the light emitting region includes at least one optical element. See Lundin et al. at column 2, line 61 through column 3, line 6. Lundin et al. describe the presence of a plurality of optical elements 30 and 40 in the optical fiber 20 at, for example, column 4, line 61 through column 6, line 4, in the context of Figures 2-5.

Lundin et al. fail to suggest providing an optical element along a light-emitting region by providing an indentation formed as a result of an embossing process. Furthermore, Lundin et al. fail to suggest providing a continuous outer cladding layer as provided by the presently claimed invention.

No sufficient reason has been provided to explain why one having ordinary skill in the art would modify Freier et al. to replace the diffuse lighting resulting from a roughened inner surface of the cladding with an optical element according to the present invention that provides for directed sidelighting.

The claimed illumination device would not have been obvious from Freier et al. and Lundin et al., and withdrawal of the rejection over Freier et al. and Lundin et al. is requested.

Objection to the Drawings

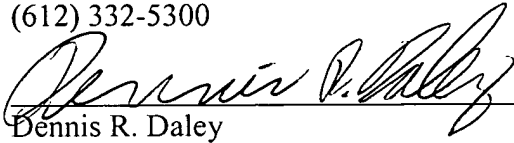
The outstanding office action includes an objection to the drawings on the grounds that "the 'a jacket layer' in claim 17 must be shown or the feature(s) canceled from the claim(s)." See page 2 of the outstanding office action. As a result, proposed new Figure 10 is provided with this amendment. Proposed new Figure 10 shows a diagram of the jacketed fiber of Example 8. Clearly, proposed Figure 10 does not introduce new matter and entry of proposed Figure 10 is requested. Furthermore, in view of the entry of proposed Figure 10, it is believed that the objection to the drawings has been rendered moot, and withdrawal of the objection is requested.

It is believed that this application is in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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